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Minoru Matsuzawa

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EXAMINER

JOLLEY, KIRSTEN

ART UNIT

PAPER NUMBER

1715

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/516,949	<b>Applicant(s)</b> MATSUZAWA ET AL.	
	<b>Examiner</b> Kirsten C. Jolley	<b>Art Unit</b> 1715	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6-9,11,12 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,4,6-9,11,12 and 14-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                     |                                                                   |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                         | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed April 13, 2010 have been fully considered. Applicant argues that claim 1 has been amended to recite that "the fence has a tip portion formed to be a reflective face that is curved to reflect the treatment solution scattered from the substrate to be treated to lead the treatment solution into the collection tank selected." Applicant further argues that Figures 12-15 of Tsuchiya illustrated that inner inclined member 60, intermediate inclined member 56 and outer inclined member 52 are entirely straight in the cross-sectional views and their tip portions are therefore also straight and not curved. The Examiner acknowledges that they are illustrated as straight and not curved, as argued by Applicant. For this reason, independent claim 1 is now rejected under 35 USC 103(a) instead of 102(b), and independent claim 9 is rejected for similar reasons, and this action is made non-final. The Examiner notes that Tsuchiya et al. teaches in col. 10, lines 16-31 that outer corner cylindrical section 54 is formed by "bending inwardly the distal end portion of the outer inclined member 52" and that intermediate inclined member 56, intermediate corner cylindrical section 58, inner inclined member 60, and inner corner cylindrical section 62 are all similarly formed by "bending inwardly." It is the Examiner's position that it would have been obvious for one having ordinary skill in the art to have designed the tip of the inclined members 60, 56, 52 of Tsuchiya et al. with a curved shape instead of its straight shape as a matter of design preference with the expectation of similar and successful results. The Examiner notes that the angle of inclination of inclined members 60, 56, 52 of Tsuchiya et al. are such that the chemicals do not attach or settle there or

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reflect to the outside of the collection tanks, which is similarly taught to be the object of the “curved” tip shape, as explained on page 8 of the arguments. *KSR* forecloses the argument that a **specific** teaching, suggestion, or motivation is required to support a finding of obviousness. See the Board decision *Ex parte Smith*, --USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing *KSR International Co. v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d at 1396) (available at <http://www.uspto.gov/web/offices/dcom/bpai/prec/fd071925.pdf>). Alternatively, a secondary reference of Parrette is newly cited to teach a curved tip portion of a fence/wall in a spin coating apparatus.

2. With respect to the JP 2000-183010 reference, Applicant similarly argues that the tip portion of the intermediate cup wall 30 (“fence”) in JP ‘010 is not curved as can be seen in Figure 4 of the reference, nor does the reference suggest such a structure for the intermediate cup wall 30. The Examiner acknowledges that the tip of cup wall 30 is illustrated as straight and not curved, as argued by Applicant. However, it is the Examiner’s position that it would have been within the skill of an engineer having ordinary skill in the art to have designed the tip of the intermediate cup wall 30 with a curved tip shape instead of its straight tip shape as a matter of design preference with the expectation of similar and successful results. The Examiner notes that the angle of inclination of intermediate cup wall 30 of JP ‘010 is such that the chemicals do not attach or settle there or reflect to the outside of the collection tanks, which is similarly taught to be the object of the “curved” tip shape, as explained on page 8 of the arguments.

Alternatively, a secondary reference of Parrette is newly cited to teach a curved tip portion of a fence/wall in a spin coating apparatus.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3-4, 7-9, 11-13, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al. (US 6,672,318) alone, or taken in view of Parrette (US 5,725,663).

Tsuchiya et al. discloses a substrate treatment apparatus and corresponding method for using the apparatus comprising: a substrate holding unit holding a substrate W to be treated; a substrate spinning unit 10 spinning the substrate to be treated held on said substrate holding unit; a treatment solution supply unit 76 for supplying a plurality of treatment solutions onto the substrate to be treated; and a treatment solution collection unit 50 having a plurality of collection tanks 64, 66, 68 placed in a manner to surround a periphery of the substrate to be treated held on said substrate holding unit, and provided to separately collect by kind the treatment solutions scattered by said substrate spinning unit from the substrate to be treated, wherein said treatment solution collection unit collects the treatment solution by one of the collection tanks with inlets of the other collection tanks closed (see Figures 13-15 and col. 10, line 9 to col.12), and wherein said treatment solution collection unit 50 has a plurality of fences which sets each collection tank.

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Claim 1 requires that the plurality of fences are driven *only upwards* to separately collect said plurality of treatment solutions. While Tsuchiya et al.'s method discloses that the plurality of fences are respectively driven only *downwards* when said plurality of treatment solutions is collected to separately collect said plurality of treatment solutions, the Examiner notes that the *apparatus* of Tsuchiya et al. would be structurally capable of driving its fences only upwards, and thus the apparatus of Tsuchiya et al. anticipates the claimed apparatus. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Further, it is well settled that the intended use of a claimed apparatus is not germane to the issue of the patentability of the claimed structure. If the prior art structure is capable of performing the claimed use then it meets the claim. *In re Casey*, 152 USPQ 235, 238 (CCPA 1967); *In re Otto*, 136 USPQ 459 (CCPA 1963).

With respect to the newly added limitation requiring “the fence has a tip portion formed to be a reflective face that is curved to reflect the treatment solution scattered from the substrate to be treated to lead the treatment solution into the collection tank selected,” the Examiner acknowledges that the inclined members are illustrated as straight and not curved. However, the Examiner notes that Tsuchiya et al. teaches in col. 10, lines 16-31 that outer corner cylindrical section 54 is formed by “bending inwardly the distal end portion of the outer inclined member 52” and that intermediate inclined member 56, intermediate corner cylindrical section 58, inner inclined member 60, and inner corner cylindrical section 62 are all similarly formed by “bending inwardly.” It is the Examiner’s position that it would have been within the skill of a design

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engineer having ordinary skill in the art to have designed the tip of the inclined members 60, 56, 52 of Tsuchiya et al. with a curved tip shape instead of its straight shape as a matter of design preference with the expectation of similar and successful results. *KSR* forecloses the argument that a **specific** teaching, suggestion, or motivation is required to support a finding of obviousness. See the Board decision *Ex parte Smith*, --USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing *KSR International Co. v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d at 1396) (available at <http://www.uspto.gov/web/offices/dcom/bpai/prec/fd071925.pdf>). Further, the Examiner notes that the angle of inclination of inclined members 60, 56, 52 of Tsuchiya et al. are such that the chemicals do not attach or settle there or reflect to the outside of the collection tanks, which is similarly taught to be the object of Applicant's "curved" tip shape. Alternatively, Parrette is cited for its teaching of a curved tip portion 86 on a peripheral edge wall of a spin coating bowl (see Figure 1). The curved tip/deflector portion of the wall causes air and liquid coming off a substrate to flow downwardly along the wall to the bottom of the bowl (col. 3, lines 32-46). It would have been obvious for one having ordinary skill in the art to have incorporated a curved tip portion to the upper edge of inclined members 60, 56, 52 in Tsuchiya et al. upon seeing the Parrette reference, with the expectation of improving flow of air and/or liquid coming off the substrate to flow back down along the members and into the drain/exhaust.

As to claim 3, Figures 12, 14, and 15 illustrate a position of the substrate W that is located above positions of the fences which are not collecting the treatment solution.

As to claim 4, Figures 13-15 illustrate fences arranged in overlapping order, in a manner to close the inlets of the collection tanks. The treatment solution collection unit performs collection in order. While Tsuchiya et al.'s method discloses that the collection unit performs

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collection in order starting from a position closest to the substrate, the Examiner notes that the *apparatus* of Tsuchiya et al. would be structurally capable of performing collection starting from the tank farthest from the substrate to be treated, and thus the apparatus of Tsuchiya et al. anticipates the claimed apparatus limitation. The intended use of a claimed apparatus is not germane to the issue of the patentability of the claimed structure. If the prior art structure is capable of performing the claimed use then it meets the claim. *In re Casey*, 152 USPQ 235, 238 (CCPA 1967); *In re Otto*, 136 USPQ 459 (CCPA 1963).

As to claim 7, drain units 70, 72, 74 drain the treatment solutions (col. 11, lines 6-9).

With respect to method claim 9, Tsuchiya et al. alone or in view of Parrette is applied for the reasons discussed above with respect to apparatus claim 1. Tsuchiya et al. differs from the claimed method in that in Tsuchiya et al.'s method, when said plurality of treatment solutions is collected, the plurality of fences are respectively driven *only downwards* to separately collected said plurality of treatment solutions by kind with each corresponding tank, instead of *only upwards* as claimed.

Tsuchiya et al.'s method teaches in col. 11, line 27 to col. 12, line 36 that, in the process steps of collection of treatment solution, fence 60, 62 and then fence 56, 58 are moved downwards between steps of mixed acid etching and dilute hydrofluoric acid etching, and between dilute hydrofluoric acid etching and rinse cleaning, respectively, to result in use of collections tanks in the following order: 68, then 66, then 64. Tsuchiya et al. does not disclose a criticality of using collections tanks in the above-described order, and it is the Examiner's position that it would have been obvious to an ordinary design engineer to instead perform the processing steps of Tsuchiya et al. by collecting in the opposite order -- from tank 64, then 66,



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and then 68 -- with the expectation of similar and equivalent results. Such a modified process would result in fences that are moved only upwards during collection, as claimed, instead of only downwards. The modified process of Tsuchiya et al. is functionally equivalent to Tsuchiya et al.'s disclosed process, and would still result in the separate collection of a plurality of treatment solutions into separate collection tanks, and would not affect the processing of the substrate or the collection of solutions. Further, it has been held that a mere reversal of the essential working parts of a device involves only routine skill in the art. *In re Einstein*, 8 USPQ 167.

As to claim 11, Figures 12, 14, and 15 illustrate a position of the substrate W that is located above positions of the fences which are not collecting the treatment solution.

As to claim 12, Figures 13-15 illustrate fences arranged in overlapping order, in a manner to close the inlets of the collection tanks. The treatment solution collection unit performs collection in order. The process of Tsuchiya et al., modified as discussed in the paragraph above, would result in collection in order starting from the collection tank at a position farthest from the substrate.

As to claim 15, drain units 70, 72, 74 drain the treatment solutions (col. 11, lines 6-9).

As to claims 8 and 16, Tsuchiya et al. lacks teaching use of a cleaning unit to clean the inside of the collection tanks. It is well known in the spin coating art that periodic cleaning of the coating apparatus is necessary in order to prevent buildup of treatment material on the inside of the apparatus because buildup could disturb the airflow inside the apparatus and/or potentially redeposit on a substrate. It would have been obvious to one having ordinary skill in the art to have provided a cleaning unit to clean the inside of the collection tanks in Tsuchiya et al. to perform such periodic cleaning.

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5. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuchiya et al. alone or in view of Parrette, as applied to claims 1 and 9 above, and further in view of JP 2000-183010 A.

As to claims 6 and 14, Tsuchiya et al. lacks a teaching of including exhaust ports for exhausting inside of its cups. It is well known in the spin coating art to include exhaust units for exhausting gases, separate from the drain units. JP '010 similarly discloses a spin coating apparatus and method which separately collects plural treatment solutions. JP '010 discloses exhaust port 35 for exhausting the inside of both cups 15 and 16. It would have been obvious for a design engineer having ordinary skill in the art to have included an exhaust port in the spin coating apparatus of Tsuchiya et al. in order to remove exhaust/contaminated gas in the apparatus, particularly upon seeing the teaching of JP '010, and further to have provided separate exhaust ports for each cup instead of a single exhaust port with the expectation of improved separation of exhaust gases.

6. Claims 1, 3-5, 7, 9, 11-13, and 15 are rejected under 35 U.S.C. 103(a) as obvious over JP 2000-183010 A alone or taken in view of Parrette.

JP '010 discloses a substrate treatment apparatus and corresponding method for using the apparatus comprising: a substrate holding unit 11 holding a substrate W to be treated; a substrate spinning unit spinning the substrate to be treated held on said substrate holding unit; a treatment solution supply unit 14a and 14b for supplying a plurality of treatment solutions onto the substrate to be treated; and a treatment solution collection unit having a plurality of collection

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tanks 15 and 16 placed in a manner to surround a periphery of the substrate to be treated held on said substrate holding unit, and provided to separately collect by kind the treatment solutions scattered by said substrate spinning unit from the substrate to be treated, wherein said treatment solution collection unit collects the treatment solution by one of the collection tanks with inlets of the other collection tanks closed (see Figures 4-5 and paragraphs [0032]-[0040] of the translation), and wherein a plurality of fences sets each collection tank and a movable fence 30 is driven upwards to form a conduit which separately collects treatment solution.

JP '010 illustrates only two cups and one movable intermediate cup wall (movable "fence") in Figures 4 and 5. However, JP '010 teaches in paragraph [0045] that use of two cups is merely exemplary and that "three or more cups can be arranged concentrically and can also be constituted" to collect the different kinds of treatment solutions. JP '010 further states that it is necessary that the cup for rinse recovery is arranged to the inside, nearest to the shaft or substrate, and that two or more cups may be arranged concentrically which correspond to the outside. It is the Examiner's position that, in the embodiment of JP '010 where the intermediate wall 30 between cups lifts upward to separate the collection cups and thus collection tanks, an engineer skilled in the art would have understood that the formation of three or more cups would necessarily require the use of two or more movable intermediate fences/walls (instead of a single one) to provide similar movable separation between the cups as described in the embodiment with only two cups. The claims are alternatively rejected under 35 USC 103(a) as well because, on the other hand, it would have been *obvious* and well within the skill of an engineer having ordinary skill in the art to have formed a third cup using a second movable intermediate wall 30 to create three cups, because the intermediate movable wall 30 is what separates cups, and since

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JP '010 teaches that its apparatus may be adapted to use additional solutions and numbers of cups. It is well settled that the mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 124 USPQ 378 (CCPA 1960).

With respect to the newly added limitation requiring "the fence has a tip portion formed to be a reflective face that is curved to reflect the treatment solution scattered from the substrate to be treated to lead the treatment solution into the collection tank selected," the Examiner acknowledges that intermediate cup wall 30 is illustrated as straight and not curved. It is the Examiner's position that it would have been within the skill of a design engineer having ordinary skill in the art to have designed the tip of the intermediate cup wall 30 of JP '010 with a curved tip shape instead of its straight shape as a matter of design preference with the expectation of similar and successful results. *KSR* forecloses the argument that a **specific** teaching, suggestion, or motivation is required to support a finding of obviousness. See the Board decision *Ex parte Smith*, --USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing *KSR International Co. v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d at 1396) (available at <http://www.uspto.gov/web/offices/dcom/bpai/prec/fd071925.pdf>). Further, the Examiner notes that the angle of inclination of intermediate cup wall '010 is such that the chemicals do not attach or settle there or reflect to the outside of the collection tanks, which is similarly taught to be the object of Applicant's "curved" tip shape. Alternatively, Parrette is cited for its teaching of a curved tip portion 86 on a peripheral edge wall of a spin coating bowl (see Figure 1). The curved tip/deflector portion of the wall causes air and liquid coming off a substrate to flow downwardly along the wall to the bottom of the bowl (col. 3, lines 32-46). It would have been obvious for one having ordinary skill in the art to have incorporated a curved tip portion to the upper edge of

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intermediate cup wall 30 in JP '010 upon seeing the Parrette reference, with the expectation of improving flow of air and/or liquid coming off the substrate to flow back down along the wall and into the drain/exhaust.

As to claims 3 and 11, Figure 4 illustrates a position of the substrate W that is located above positions of the fences which are not collecting the treatment solution.

As to claims 4 and 12, Figures 5 illustrates fences arranged in overlapping order, in a manner to close the inlets of the collection tanks. The treatment solution collection unit performs collection in order, starting from the collection tank at a position farther from the substrate to be treated.

As to claims 5 and 13, the figures illustrate that the fence has a tip portion formed to be a reflective face that is curved to reflect the treatment solution scattered from the substrate W into the selected collection tank.

As to claims 7 and 15, drain units 15b and 16b drain the treatment solutions.

As to claims 6 and 14, JP '010 discloses exhaust port 35 for exhausting the inside of both cups 15 and 16. Thus JP '010 teaches using a single exhaust port/unit instead of separate ports. It would have been obvious for a design engineer having ordinary skill in the art to have provided separate exhaust ports for each cups instead of a single exhaust port with the expectation of similar results and improved separation of exhaust gases.

As to claims 8 and 16, JP '010 lacks teaching use of a cleaning unit to clean the inside of the collection tanks. It is well known in the spin coating art that periodic cleaning of the coating

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apparatus is necessary in order to prevent buildup of treatment material on the inside of the apparatus because buildup could disturb the airflow inside the apparatus and/or potentially redeposit on a substrate. It would have been obvious to one having ordinary skill in the art to have provided a cleaning unit to clean the inside of the collection tanks to perform such periodic cleaning.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Tuesday and Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kirsten C Jolley/

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Primary Examiner, Art Unit 1715

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